

## SEQUENCE LISTING

<110> Københavns Universitet  
 Louise Jørgensen  
 5 Pamela Magistrado  
 Thomas Lavstsen  
 Ali Salanti  
 Morten A. Nielsen  
 Trine Staalsø  
 10 Lars Hviid  
 Thor Theander  
 Anja Jensen

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				115													120																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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	Ile	Asp	Ser	Ile	Asn	Trp	Lys	Asn	Asp	Leu	Thr	Asn	Cys	Ile	Asn	Asn
			595					600					605			
	Thr	Asn	Val	Thr	Asp	Cys	Lys	Asn	Asp	Cys	Asn	Thr	Asn	Cys	Lys	Cys
		610					615					620				
5	Phe	Glu	Asn	Trp	Ala	Lys	Thr	Lys	Glu	Asn	Glu	Trp	Lys	Lys	Val	Lys
		625				630					635					640
	Thr	Ile	Tyr	Lys	Asn	Glu	Asn	Gly	Asn	Thr	Asn	Asn	Tyr	Tyr	Lys	Lys
					645					650						655
	Leu	Asn	Asn	His	Phe	Gln	Gly	Tyr	Phe	Phe	His	Val	Met	Lys	Glu	Leu
10					660					665					670	
	Asn	Lys	Glu	Glu	Lys	Trp	Tyr	Lys	Leu	Met	Glu	Asp	Leu	Lys	Glu	Lys
			675					680					685			
	Ile	Asp	Ser	Ser	Asn	Leu	Lys	Asn	Gly	Thr	Lys	Asp	Ser	Glu	Gly	Ala
		690					695					700				
15	Ile	Lys	Val	Leu	Phe	Asp	His	Leu	Lys	Asp	Ile	Ala	Glu	Arg	Cys	Ile
		705				710					715					720
	Asp	Asn	Asn	Ser	Lys	Asp	Ser	Cys	Pro	Pro	Ser	Val	Asp	Thr	Lys	Thr
					725					730					735	
	Asn	Pro	Cys	Ala	Lys	Pro	Pro	Gly	Ser	Lys	Pro	Thr	Lys	Ser	Val	Lys
20					740					745					750	
	Gln	Leu	Ala	Glu	His	Met	Gln	Gln	Lys	Ala	Gln	Lys	Leu	Leu	Gly	Thr
			755					760							765	
	Arg	Gly	Gly	Glu	Ser	Lys	Leu	Lys	Gly	Asp	Ala	Thr	Arg	Gly	Thr	Tyr
		770					775					780				
25	Asn	Leu	Gly	Gly	Gln	Gly	Asn	Thr	Leu	Asn	Gly	Asp	Ile	Cys	Lys	Ile
		785				790					795					800
	Thr	Lys	Asn	His	Thr	Asn	Asp	Ser	Arg	Pro	Asn	Gly	Glu	Pro	Cys	Thr
					805					810					815	
	Gly	Lys	Asp	Lys	Val	Lys	Asn	Gly	Phe	Arg	Leu	Lys	Ile	Gly	Thr	Pro
30					820				825						830	
	Trp	Thr	Asn	Ile	Val	Gln	Lys	Lys	Lys	Lys	Ser	Tyr	Lys	Asp	Phe	
			835					840					845			
	Tyr	Leu	Pro	Pro	Arg	Arg	Gln	His	Met	Cys	Thr	Ser	Asn	Leu	Glu	Asn
		850					855					860				
35	Leu	Ser	Thr	Ser	Ser	Lys	Gly	Leu	Ser	Asn	Gly	Ser	Phe	Ala	Ser	His
		865				870					875					880
	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu	Ala	Ala	Lys	Phe	Glu	Ala	Gln	Lys
					885					890					895	
	Ile	Ile	Leu	Val	Tyr	Lys	Asn	Lys	Asn	Asn	Ile	Asn	Ile	Arg	Lys	Arg
40					900					905					910	
	Ile	Thr	Asp	Pro	Asn	Asp	Gln	Ala	Thr	Val	Cys	Arg	Ala	Ile	Arg	Tyr
			915					920					925			
	Ser	Phe	Ala	Asp	Leu	Gly	Asp	Ile	Ile	Arg	Gly	Lys	Asp	Met	Trp	Asn
		930					935					940				
45	Ile	Asn	Ser	Asp	Ala	Lys	Asp	Leu	Gln	Asp	Arg	Leu	Glu	Lys	Ile	Phe
		945				950					955					960
	Lys	Thr	Ile	Asn	Glu	Lys	Leu	Pro	Asn	Glu	Ile	Gln	Lys	Arg	Tyr	Thr
					965					970					975	
	Asn	Arg	Glu	Asn	Lys	His	Leu	Asp	Leu	Arg	Ser	Asp	Trp	Trp	Glu	Ala
50					980				985						990	
	Asn	Arg	His	Gln	Val	Trp	Arg	Ala	Met	Lys	Cys	Ala	Thr	Lys	Gly	Ile
					995				1000				1005			
	Ser	Asn	Asn	Asn	Cys	Asn	Gly	Ile	Pro	Ile	Glu	Asp	Tyr	Ile	Pro	Gln
		1010					1015					1020				
55	Arg	Leu	Arg	Trp	Met	Thr	Glu	Trp	Ala	Glu	Trp	Tyr	Cys	Lys	Lys	Gln
		1025				1030					1035					1040
	Ser	Gln	Glu	Tyr	Glu	Lys	Leu	Glu	Glu	Lys	Cys	Gly	Met	Cys	Thr	Gly
					1045					1050						1055
	Lys	Gly	Gln	Gly	Asp	Gly	Lys	Asp	Cys	Thr	Gln	Lys	Asp	Lys	Glu	Cys

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			1060			1065			1070								
	Ser	Pro	Cys	Lys	Lys	Ala	Cys	Asp	Ala	Tyr	Lys	Lys	Glu	Ile	Glu	Lys	
			1075					1080					1085				
	Trp	Glu	Lys	Gln	Trp	Lys	Thr	Val	Ser	Ala	Ile	Tyr	Gln	Ile	Leu	Tyr	
5			1090				1095					1100					
	Ala	Lys	Ala	Arg	Ile	Val	Ala	Ser	Asn	Gly	Gly	Pro	Gly	Tyr	Tyr	Asn	
			1105			1110					1115					1120	
	Thr	Glu	Val	Gln	Lys	Lys	Asp	Arg	Ser	Val	Tyr	Asp	Phe	Leu	Tyr	Glu	
					1125					1130						1135	
10	Leu	His	Leu	Gln	Asn	Gly	Gly	Lys	Lys	Gly	Pro	Pro	Pro	Ala	Thr	His	
					1140					1145						1150	
	Pro	Tyr	Lys	Ser	Val	Asn	Thr	Arg	Asp	Lys	Arg	Asp	Ala	Thr	Asp	Asp	
			1155					1160					1165				
	Thr	Thr	Pro	Thr	Val	Tyr	Ser	Thr	Ala	Ala	Gly	Tyr	Val	His	Gln	Glu	
15			1170				1175					1180					
	Ala	His	Ile	Gly	Asp	Cys	Lys	Glu	Gln	His	Val	Phe	Cys	Asp	Asn	Asn	
			1185			1190					1195					1200	
	Gly	Asn	Lys	Glu	Lys	Tyr	Ala	Phe	Lys	Asn	Pro	Pro	Asn	Val	Tyr	Val	
					1205					1210						1215	
20	Glu	Ala	Cys	Lys	Cys	Met	Thr	Arg	Glu	Ala	Pro	Pro	Pro	Pro	Thr	Thr	
					1220					1225						1230	
	Pro	Ser	Thr	Pro	Asn	Pro	Cys	Ala	Glu	Thr	Gly	Gly	Val	His	Thr	Ile	
			1235					1240					1245				
	Lys	Thr	Val	Thr	Asp	Val	Ala	Lys	Ile	Leu	Gln	Gly	Glu	Ala	Asn	Glu	
25			1250				1255					1260					
	Thr	Met	Leu	Lys	Asn	Ser	Ser	Asn	Gly	Asn	Asp	Lys	Asp	Glu	Ser	Lys	
			1265			1270					1275					1280	
	Leu	Lys	Gly	Lys	Ala	Glu	Glu	Gly	Asp	Tyr	Ser	Arg	Gly	Gly	Thr	Pro	
					1285					1290						1295	
30	Ser	Asp	Phe	Asn	Asn	Asn	Leu	Cys	Gly	Ile	Thr	Gln	Lys	His	Ser	Asn	
					1300					1305						1310	
	Ala	His	Asn	Asp	Ser	Gln	Gln	Pro	Cys	Tyr	Gly	Lys	Asp	Gln	Lys	Arg	
			1315					1320					1325				
	Phe	Asn	Val	Gly	Thr	Glu	Trp	Ser	Phe	Lys	Asp	Asn	His	Arg	Lys	Arg	
35			1330				1335					1340					
	Thr	His	Pro	Glu	Ala	Tyr	Met	Pro	Pro	Arg	Arg	Glu	His	Ile	Cys	Thr	
			1345			1350					1355					1360	
	Ser	Asn	Leu	Glu	Tyr	Leu	Ile	His	Lys	Arg	Lys	Lys	Pro	Ile	Ile	Glu	
					1365					1370						1375	
40	Gly	Asp	Pro	Asn	Lys	Ile	Ile	His	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu	
					1380					1385						1390	
	Ala	Ala	Lys	Tyr	Glu	Ala	Glu	Asn	Ile	Lys	Lys	Leu	Tyr	Glu	Glu	Asn	
			1395					1400					1405				
	Asn	Asn	Arg	Lys	Asp	Gln	Glu	Gly	Ile	Cys	Arg	Ala	Met	Lys	Tyr	Ser	
45			1410				1415					1420					
	Phe	Ala	Asp	Ile	Gly	Asp	Ile	Ile	Arg	Gly	Lys	Asp	Met	Trp	Ile	Glu	
			1425			1430					1435					1440	
	Asn	Asn	Asp	Ala	Lys	Arg	Leu	Gln	Thr	Asn	Leu	Lys	Glu	Ile	Phe	Thr	
					1445					1450						1455	
50	Lys	Ile	Lys	Glu	Lys	Thr	Gly	Gly	Thr	Thr	Tyr	Asn	Glu	Asp	Asn	Asp	
					1460					1465						1470	
	Pro	Tyr	Leu	Lys	Leu	Arg	Ala	Asp	Trp	Trp	Glu	Ala	Asn	Arg	Ala	Lys	
			1475					1480					1485				
	Val	Trp	Lys	Ala	Met	Lys	Cys	Lys	Thr	Asn	Gly	Val	Asp	Ile	Thr	Cys	
55			1490				1495					1500					
	Asp	Ser	Asp	His	Thr	Pro	Leu	Asp	Asp	Tyr	Ile	Pro	Gln	Arg	Leu	Arg	
			1505			1510					1515					1520	
	Trp	Met	Thr	Glu	Trp	Ala	Glu	Trp	Tyr	Cys	Lys	Ala	Gln	Ser	Gln	Glu	
					1525					1530						1535	

Tyr Lys Lys Leu Glu Glu Lys Cys Ser Gln Cys Lys Ser Lys Gly Lys  
 1540 1545 1550  
 Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys  
 1555 1560 1565  
 5 Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln  
 1570 1575 1580  
 Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln  
 1585 1590 1595 1600  
 Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys  
 1605 1610 1615  
 10 Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu  
 1620 1625 1630  
 Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His  
 1635 1640 1645  
 15 Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp  
 1650 1655 1660  
 Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro  
 1665 1670 1675 1680  
 His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu  
 1685 1690 1695  
 20 Glu Pro Lys Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val  
 1700 1705 1710  
 Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp  
 1715 1720 1725  
 25 His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp  
 1730 1735 1740  
 Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met  
 1745 1750 1755 1760  
 Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn  
 1765 1770 1775  
 30 Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala  
 1780 1785 1790  
 Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn  
 1795 1800 1805  
 35 Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp  
 1810 1815 1820  
 Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys  
 1825 1830 1835 1840  
 Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly  
 1845 1850 1855  
 40 Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr  
 1860 1865 1870  
 Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile  
 1875 1880 1885  
 45 Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn  
 1890 1895 1900  
 Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn  
 1905 1910 1915 1920  
 Ala Ile Lys Ser Glu Leu Glu Asp Phe Val Asn Arg Pro Gln Phe Leu  
 1925 1930 1935  
 50 Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile  
 1940 1945 1950  
 Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu  
 1955 1960 1965  
 55 Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp  
 1970 1975 1980  
 Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu  
 1985 1990 1995 2000  
 Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp



	2005							2010				2015				
	Asp	Lys	Arg	Lys	Glu	Leu	Tyr	Lys	Ser	Ile	Asp	Asp	Val	Ala	Ser	Ser
	2020							2025				2030				
5	Thr	Gln	Ala	Tyr	Gln	Tyr	Leu	His	Ala	Gln	Leu	Lys	Lys	Leu	Cys	Gly
	2035							2040				2045				
	Asn	Ala	Asp	Cys	Lys	Cys	Met	Asp	Gly	Glu	Ser	Lys	Glu	Thr	Thr	Gly
	2050							2055				2060				
	Gln	Pro	Asp	Asn	Ser	His	Asp	Ser	His	Met	Pro	Ala	Ser	Leu	Asp	Asp
	2065							2070				2075				
10	Glu	Pro	Glu	Glu	Val	Asn	Gly	Lys	Cys	Asn	Cys	Lys	Val	Lys	His	Arg
	2085							2090				2095				
	Pro	Gln	Pro	Pro	Leu	Ala	Leu	Pro	Pro	Pro	Ala	Pro	Ser	Gly	Pro	Pro
	2100							2105				2110				
	Ala	Glu	Asp	Gln	Ile	Glu	His	Asp	Asn	Arg	Gly	Arg	Ser	Glu	Arg	Gly
15	2115							2120				2125				
	Asp	Gln	Gly	Pro	Leu	Pro	Ala	Arg	Pro	Pro	Pro	Pro	Pro	Gln	Ala	Ala
	2130							2135				2140				
	Gln	Pro	Pro	Gln	Pro	Lys	Pro	Lys	Arg	Thr	Gly	Glu	Gly	Leu	Gly	Arg
	2145							2150				2155				
20	Asn	Leu	Pro	Pro	Ala	Asp	Arg	Asn	Thr	Asn	Leu	Ser	Asp	Ser	Glu	Glu
	2165							2170				2175				
	Glu	Asp	Asp	Glu	Asp	Asp	Asp	Glu	Val	Gln	Glu	Glu	Glu	Glu	Thr	Pro
	2180							2185				2190				
	Pro	Ser	Glu	Ala	Glu	Glu	Gly	Glu	Gly	His	Val	Glu	Thr	Glu	Glu	Glu
25	2195							2200				2205				
	Thr	Lys	Pro	Val	Lys	Glu	Lys	Thr	Glu	Gly	Ala	Gly	Ala	Thr	Glu	Val
	2210							2215				2220				
	Thr	Lys	Gln	Gly	Ser	Ala	Pro	Thr	Ala	Thr	Thr	Pro	Thr	Val	Glu	Asp
	2225							2230				2235				
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	gaatctgaac	ctgaatccga	agaagaagaa	gacgatgccg	aagaggagga	ggagccggca	7260
35	aaggagacgg	ctaccacaga	gacaacacaa	ccagcagcac	cagcgggacc	accggtaaca	7320
	ccagtaccag	aactaccggg	accacccgca	ccagcgggac	cagcagctga	tggcccccatt	7380
	gaggatgacg	aagacgccga	aaacgaagac	gatgatgacg	tcggctccgc	caccggcaca	7440
	gaagacgatg	acgacgacga	agatgacgac	gacgaagacg	aagaggactc	agcagacgaa	7500
	ggtgaagggtg	aaggcgacgg	cggtgacgtc	ggcgaggagg	aagatgaaga	tcacggcggc	7560
40	caggaggcgg	aggggggtgt	accacaacca	gcagcaccac	aaccaccaac	cccacaactc	7620
	ttggatgacc	ccctccttaa	aaccgcctc	atgtcttcta	ccatcctctg	gatggttagt	7680
	atcgggtttg	cggcgttgac	ttacttttta	ctcaagaaaa	aatccaaatc	ttctgttgac	7740
	ttgttgctgtg	tactgaatat	cccgaagga	gattatgaaa	tgcttacgtt	gaaatccaaa	7800
	aataggtaca	taccatatag	aagtgggttca	tataaaggca	aaacatatat	atatatggaa	7860
45	ggagatagtg	atagtggaca	ctactacgaa	gatacaactg	atattacttc	atccgaaagt	7920
	gaatatgaag	aattggatat	taatgagata	tatccgtatc	agtcaccaa	atacaaaaca	7980
	ttgattgaag	tggtactaga	accatccaaa	agtaatggta	acacaccaag	taaggggtgat	8040
	ggtaacacac	taggtgatga	tatggtacct	accacgaata	catttacaga	tgaggaatgg	8100
	agtgaattga	aacatgattt	tatatcaca	tatatacaaa	gtgaaccact	ggatgtacca	8160
50	aaagttgggtg	tatcaaagga	attaccaatg	aatataggag	gtaatgtttt	agatgatggt	8220
	ataaacgaaa	aaccttttat	tacttctatt	catgataggg	atttatatac	tggggaagaa	8280
	attaaatata	atattaatat	gggtactaat	agtatggacg	atccaacata	tgtatcaaat	8340
	aatgtatat	ctggtatcga	tttaattaat	gacacattaa	gtggtaataca	acatatattg	8400
	atatatgatg	aagtgcataa	aagaaaagaa	aatgaattat	ttggaacaaa	ttataagaaa	8460
55	aatacatcaa	ataacaatgt	agctaaatta	acaaatagtg	atcctattat	gaaccaatta	8520
	gatttggttac	atacatgggt	agatagacat	agagatatgt	gtgagaagtg	gaataaaaaag	8580
	gaagaattgt	tagataaatt	aaatgaacaa	tggaataaag	ataatgatgg	tggtgatata	8640
	ccaaatgata	acaaaaagtt	gaatacggat	gtttctatac	aaatagatat	agatgaaaaat	8700
	aaaggaaaga	aagaatttag	taatattggat	acaaacgtgg	atacacctac	tatggatagt	8760

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atattggatg atttggaac atataatgaa cttttttatg atatatttga ggatgatgtg 8820  
 tattatgatg tatatgatga aaaccattt gtggatgata tacctatgga tcataataaa 8880  
 gtagatgtac ctaagaaagt acatattgaa atgaaaatcc ttaataatac atccaatgga 8940  
 tcgttggaac aacaatttcc tatatcggat gtatggaata tataa 8985

5

&lt;210&gt; 4

&lt;211&gt; 2994

10 &lt;212&gt; PRT

&lt;213&gt; Plasmodium falciparum

&lt;400&gt; 4

Met Gly Ser Gln Thr Ser Lys Phe Ser Lys Thr Val Val Gly Asn Glu  
 15 1 5 10 15  
 Thr His Asn Ser Ala Arg Asn Val Leu Glu Gly Phe Ala Lys Asp Ile  
 20 20 25 30  
 Lys Arg Asp Val Ser Asn Asn Ala Lys Arg His Gly Lys Val Leu Lys  
 35 40 45  
 Gly Asn Leu Arg Asp Ala Lys Phe Tyr His Asp Tyr Ser Lys Leu Arg  
 50 55 60  
 Asp Ile Pro Arg Ser Pro Cys Asp Leu Asp Phe Trp Phe His Thr Asn  
 65 70 75 80  
 Val Trp Arg Asp Lys Ala Tyr Glu Arg Asp Pro Cys Tyr Gly Arg Gln  
 25 85 90 95  
 Ala Lys Asn Asn Tyr Asn Leu Glu Gly Ala Val Cys Thr Asn Ser Lys  
 100 105 110  
 Ile Lys Gly Asn Glu Asn Lys Ile Asn Asp Ile Gly Ala Cys Ala Pro  
 115 120 125  
 Tyr Arg Arg Arg Asn Ile Cys Asp Tyr Asn Leu Glu His Leu Asn Glu  
 130 135 140  
 Arg Asn Val Leu Asn Thr His Asp Leu Leu Gly Asn Val Leu Val Met  
 145 150 155 160  
 Ala Lys Arg Glu Gly Glu Ser Ile Val Glu Lys His Pro Asn Arg Gly  
 35 165 170 175  
 Ser Ser Glu Val Cys Ile Ala Leu Ala Arg Ser Phe Ala Asp Ile Gly  
 180 185 190  
 Asp Ile Leu Arg Gly Lys Asp Met Tyr Val Gly Tyr Asp Glu Lys Glu  
 195 200 205  
 Lys Asn Arg Arg Lys Gln Leu Glu Asn Lys Leu Lys Asp Ile Phe Asp  
 40 210 215 220  
 Asn Ile Tyr Lys Asp Leu Thr Lys Lys Lys Gly Arg Asn Gly Lys Lys  
 225 230 235 240  
 Ser Ala Leu Gln Glu Arg Tyr Asn Asp Pro Lys Gly Asp Phe Phe Gln  
 45 245 250 255  
 Leu Arg Glu Asp Trp Trp Ala Leu Asn Arg Glu Asp Val Trp Lys Ala  
 260 265 270  
 Leu Thr Cys Ser Ala Asp Asp Ser Glu Asp Tyr Phe Ile Gln Ser Glu  
 275 280 285  
 Gly Val Thr Lys Ser Phe Thr Asn Pro Lys Cys Gly His Gly Asp Asn  
 50 290 295 300  
 Glu Val Leu Thr Asn Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe  
 305 310 315 320  
 Thr Glu Trp Ala Glu Glu Phe Cys Arg Ile Arg Lys Ile Lys Leu Gly  
 55 325 330 335  
 Lys Val Lys Asn Glu Cys Arg Gly Glu Thr Ser Gly Lys Arg Tyr Cys  
 340 345 350  
 Ser Gly Asp Gly Tyr Asp Cys Thr Lys Thr Asp Ile Ser Arg Asn Ile  
 355 360 365

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	Phe	Tyr	Met	Asp	Leu	Asp	Cys	Pro	Arg	Cys	Glu	Glu	Glu	Cys	Arg	Lys
	370						375					380				
	Tyr	Asp	Glu	Trp	Ile	Glu	Asn	Lys	Glu	Asn	Glu	Leu	Asp	Lys	Gln	Lys
	385					390					395					400
5	Asn	Lys	Tyr	Thr	Lys	Glu	Ile	Glu	Lys	Leu	Lys	Asp	Asn	Ser	Lys	Ser
					405					410					415	
	Asn	Tyr	Asp	Lys	Asn	Phe	Tyr	Leu	Thr	Leu	Thr	Lys	Lys	Tyr	Gly	Ser
				420					425					430		
10	Ile	Asn	Leu	Phe	Leu	Asp	Thr	Leu	Lys	Glu	Gly	Ser	His	Cys	Ser	Tyr
			435					440					445			
	Asn	Thr	Ile	Glu	Asp	Lys	Ile	Asp	Phe	Asn	Lys	Ala	Asn	Gln	Thr	Phe
	450						455					460				
	Thr	Ser	Ser	Lys	Phe	Cys	Gly	Ala	Cys	Pro	Phe	Tyr	Gly	Val	Lys	Cys
	465					470					475					480
15	Asn	Trp	Lys	Thr	Cys	Thr	Glu	Val	Lys	Glu	Asn	Glu	Tyr	Lys	Lys	Lys
					485					490					495	
	Asn	Lys	Val	Asp	Ser	Thr	His	Thr	Thr	Glu	Gln	Pro	Thr	Ala	Ile	Asp
				500					505					510		
20	Val	Leu	Val	Thr	His	Ile	Arg	Gly	Thr	Asn	Ile	Pro	Glu	Asp	Leu	Lys
			515					520					525			
	Asp	Cys	Lys	Lys	Tyr	Gly	Leu	Phe	Lys	Gly	Met	Arg	Lys	Gln	Ala	Trp
	530					535						540				
	Lys	Cys	Gln	Tyr	Ile	Asn	Pro	Tyr	Asp	Glu	Cys	Lys	Leu	Ser	Pro	Phe
	545					550					555					560
25	Val	Lys	Asp	Ile	Asp	Val	Asp	Asp	Arg	Ile	Leu	Phe	Lys	Val	Leu	Phe
					565					570					575	
	Glu	Arg	Trp	Leu	Lys	Tyr	Phe	Ile	Gln	Asp	Phe	Asn	Asn	Val	Lys	Asp
				580					585					590		
30	Lys	Ile	Asn	Arg	Cys	Thr	Lys	Phe	Glu	Lys	Gly	Lys	Asp	Asn	Thr	Cys
			595					600					605			
	Ile	Lys	Gly	Cys	Lys	His	Lys	Cys	Glu	Cys	Val	Glu	Lys	Trp	Ile	Lys
	610						615					620				
	Ile	Lys	Glu	Ala	Glu	Trp	Lys	Lys	Ile	Asn	Gln	His	Tyr	Asn	Gln	Gln
	625					630					635					640
35	Lys	Lys	His	Tyr	Thr	Tyr	Ser	Val	Pro	Arg	Trp	Val	Asn	Ser	Tyr	Leu
					645					650					655	
	Thr	His	Gln	His	Phe	Ser	Ser	Asp	Phe	Ile	Asn	Ala	Leu	Glu	Ala	Phe
				660					665					670		
40	Lys	Asn	Ile	Arg	Gly	Leu	Glu	Asn	Leu	Lys	Glu	Cys	Ser	Ser	Asp	Thr
			675					680					685			
	Cys	Lys	Ile	Glu	Lys	Ile	Arg	Thr	Ile	Asp	Asp	Asp	Leu	Ile	Lys	Glu
	690						695					700				
	Leu	Ile	Ser	Lys	Leu	Lys	Asp	Lys	Cys	Ala	Met	Cys	Lys	Asn	Gln	His
	705					710					715					720
45	Lys	Ala	Thr	Lys	Gly	Lys	Glu	Cys	Cys	Gly	Lys	Leu	Pro	Lys	Thr	Leu
					725					730					735	
	Asn	Asp	Gln	Asp	Asp	Glu	Glu	Asp	Glu	Glu	Tyr	Glu	Ala	Pro	Pro	Pro
				740					745					750		
50	Pro	Thr	Pro	Pro	Arg	Thr	Gln	Lys	Asn	Pro	Cys	Val	Asn	Gly	Gln	Asn
			755					760					765			
	Gln	Lys	Val	Arg	Lys	Ile	Arg	Ser	Val	Arg	Arg	Val	Pro	Lys	Arg	Met
	770						775					780				
	Gln	Lys	Gln	Ala	Ser	Val	Arg	Val	Pro	Arg	Ala	Arg	Gln	Gly	Gly	Glu
	785					790					795					800
55	Arg	Glu	Gln	Val	Val	Lys	Asn	Gly	Arg	Gln	Asp	His	His	Leu	Gln	Arg
					805					810					815	
	Val	Leu	Leu	Val	Gly	Glu	Ala	Glu	Ala	Glu	Glu	Pro	Glu	Thr	Ala	Glu
				820					825					830		
	Glu	Lys	Lys	Glu	Glu	Glu	Lys	Glu	Glu	Asp	Thr	Asp	Gly	Lys	Val	Gln



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		835		840		845													
	Pro	Pro	Pro	Ala	Ala	Thr	Thr	Pro	Gly	Val	Lys	Pro	Pro	Cys	Asp	Ile			
		850					855					860							
	Val	Glu	Lys	His	Phe	Lys	Asp	Lys	His	Asp	Asn	Thr	Gly	Ala	Ile	Asp			
5	865					870					875					880			
	His	Cys	Asn	Pro	Lys	Lys	Asp	Tyr	Pro	Pro	Trp	Lys	Asn	Asp	Lys	Ser			
					885					890					895				
	Leu	Val	Asp	Glu	Asp	Gly	Val	Tyr	Met	Pro	Pro	Arg	Arg	Gln	Lys	Leu			
				900					905					910					
10	Cys	Val	Ile	Asn	Leu	Glu	His	Phe	Lys	Glu	Asn	Thr	Ser	Asp	Asp	Leu			
				915				920					925						
	Arg	Glu	Ala	Phe	Ile	Lys	Cys	Ala	Ala	Ala	Glu	Thr	Tyr	Leu	Leu	Trp			
		930					935					940							
	Gln	Lys	Tyr	Lys	Glu	Asp	Asn	Asn	Gly	Gly	Glu	Asp	Leu	Gln	Asn	Gln			
15	945					950					955					960			
	Leu	Lys	Ser	Gly	Lys	Ile	Pro	Glu	Asp	Phe	Lys	Arg	Gln	Met	Phe	Tyr			
					965					970					975				
	Thr	Phe	Gly	Asp	Tyr	Arg	Asp	Phe	Leu	Phe	Gly	Thr	Asp	Ile	Ser	Lys			
				980					985					990					
20	Leu	Asn	Lys	His	Thr	Glu	Ala	Val	Lys	Thr	Asn	Ile	Asp	Arg	Ile	Phe			
				995				1000					1005						
	Pro	Pro	Thr	Glu	Arg	Thr	Asn	Asp	Thr	Ile	Arg	Lys	Glu	Phe	Trp	Glu			
		1010					1015					1020							
	Lys	Asn	Ala	Glu	Ser	Ile	Trp	Gln	Gly	Met	Leu	Cys	Ala	Leu	Ser	Tyr			
25	1025					1030					1035					1040			
	Asn	Ser	Asn	Asp	Lys	Lys	Met	Asp	Pro	Asp	Val	Gln	Lys	Glu	Leu	Asn			
					1045					1050					1055				
	Ser	Thr	Tyr	Asn	Tyr	Asp	Thr	Ile	Lys	Asn	Asn	Leu	Glu	Asp	Phe	Ala			
				1060					1065					1070					
30	Asn	Arg	Pro	Gln	Phe	Leu	Arg	Trp	Phe	Ile	Glu	Trp	Ser	Asp	Glu	Phe			
				1075				1080					1085						
	Cys	Arg	Glu	Arg	Lys	Lys	Lys	Glu	Glu	Lys	Val	Gly	Ser	Ala	Cys	Lys			
		1090					1095					1100							
	Asn	Asp	Tyr	Glu	Gly	Cys	Ala	Asn	Thr	Lys	Asp	Asn	Gly	Asn	Gly	Asn			
35	1105					1110					1115					1120			
	Cys	Val	Asn	Ala	Cys	Asn	Ala	Tyr	Lys	Lys	Tyr	Ile	Thr	Asp	Lys	Lys			
					1125						1130				1135				
	Glu	Gln	Tyr	Glu	Lys	Gln	Ala	Lys	Lys	Phe	Asp	Ile	Asp	Lys	Ser	Gln			
				1140					1145					1150					
40	Asn	Lys	Pro	Gly	Tyr	Glu	Asp	Tyr	Ser	Gly	Lys	Lys	Ala	Ser	Glu	Tyr			
				1155				1160					1165						
	Leu	Lys	Glu	Lys	Cys	Ile	Asn	Ser	Ser	Cys	Asp	Tyr	Met	Leu	Lys	Leu			
						1175						1180							
	Lys	Asp	Asn	Ser	Asn	Tyr	Trp	Glu	Lys	Pro	His	Thr	Thr	Tyr	Asp	Asp			
45	1185					1190					1195					1200			
	Asn	Ser	Leu	Gln	Asn	Lys	Cys	Ser	Cys	Pro	Leu	Ser	Pro	Cys	Glu	Ile			
					1205					1210					1215				
	Val	Asp	Lys	Thr	Leu	Gly	Asp	Lys	Thr	Ser	Lys	Ser	Tyr	Ala	Glu	Gly			
				1220					1225					1230					
50	Cys	Lys	Trp	Lys	Tyr	Gly	Lys	Met	Pro	Leu	Gly	Leu	Gly	Trp	Leu	Cys			
				1235				1240					1245						
	Asn	Asp	Lys	Glu	Gly	Glu	Lys	Gly	Lys	Glu	Asp	Gly	Leu	Cys	Ile	Pro			
				1250			1255				1260								
	Pro	Arg	Arg	Lys	Arg	Leu	Tyr	Val	Lys	Asp	Leu	Glu	Thr	Phe	Ser	Asp			
55	1265					1270					1275					1280			
	His	Thr	Thr	Val	Gly	Leu	Arg	Glu	Ala	Phe	Ile	Lys	Cys	Ala	Ala	Val			
					1285					1290					1295				
	Glu	Thr	Phe	Phe	Ala	Trp	His	Glu	Phe	Thr	Lys	Glu	Lys	Glu	Arg	Glu			
				1300					1305					1310					

Tyr Lys Glu Glu Lys Gln Arg Asn Gly Glu Leu Gly Phe Ile Asp Glu  
 1315 1320 1325  
 Asn Asp Gln Ile Pro Lys Asp Pro Asp Asn Pro Gln Asn Lys Ile Arg  
 1330 1335 1340  
 5 Lys Asn Gly Glu Ile His Glu Glu Phe Lys Ser Gln Met Phe Tyr Thr  
 1345 1350 1355 1360  
 Leu Ala Asp Tyr Arg Asp Ile Leu Phe Gly Asn Asn Ile Gly Ile Gly  
 1365 1370 1375  
 Asn Asp Met Gly Lys Val Lys Ser Asn Ile Asp Lys Val Phe Ala Asn  
 1380 1385 1390  
 10 Ser Ser Gly Lys Thr Pro Thr Ala Lys Lys Thr Thr Pro Lys Glu Trp  
 1395 1400 1405  
 Trp Glu Lys Asn Ala Lys Asp Ile Trp Glu Gly Met Leu Cys Ala Leu  
 1410 1415 1420  
 15 Ser Tyr Asp Thr Lys Thr Lys Ile Lys Asn Glu Glu Leu Arg Lys Lys  
 1425 1430 1435 1440  
 Leu Ile Asp Pro Lys Asn Ser Asn Tyr Met Tyr Glu Lys Val Thr Phe  
 1445 1450 1455  
 Ser Ser Asp Asn Asn Thr Asn Leu Ser Lys Phe Thr Glu Arg Pro Pro  
 1460 1465 1470  
 20 Phe Phe Arg Trp Phe Gln Glu Trp Gly Glu Glu Phe Cys Arg Lys Lys  
 1475 1480 1485  
 Lys Ile Lys Ile Asp Lys Ile Glu Lys Glu Cys Arg Gly Pro Tyr Gly  
 1490 1495 1500  
 25 Arg Asn His Cys Asp Gly Asp Gly Phe Asp Cys Ser Glu Ile Gly Pro  
 1505 1510 1515 1520  
 Asn Glu Asn Gly Ser Phe Ala Ile Phe Lys Cys Pro Ser Cys Ala Ile  
 1525 1530 1535  
 Ser Cys Arg Ser Tyr Lys Thr Trp Ile Asn Thr Lys Lys Asp Glu Phe  
 1540 1545 1550  
 30 Lys Lys Gln Glu Lys Leu Tyr Asn Lys Glu Ile Lys Asp Asn Lys Ser  
 1555 1560 1565  
 Asn Tyr Asp Asn Ile Tyr Asp Lys Glu Phe Val Lys Asn Leu Cys Thr  
 1570 1575 1580  
 35 Asp Tyr Lys Ser Val Asp Ser Phe Leu Lys Lys Leu Lys Glu Gly Pro  
 1585 1590 1595 1600  
 Cys Cys Asn Lys Asn Thr Lys Asp Ser Lys Ile Asp Phe Lys Asp Thr  
 1605 1610 1615  
 Glu Glu Thr Phe Arg Asn Ala Glu Tyr Cys Asp Pro Cys Pro Val Phe  
 1620 1625 1630  
 40 Gly Val Ile Cys Asn Asn Gly Asp Cys Ser Asn Ser Thr Glu Lys Lys  
 1635 1640 1645  
 Cys Asp Ala Gln Glu Phe Lys Val Thr Tyr Asp Val Lys Asn Lys Glu  
 1650 1655 1660  
 45 Asn Pro Asn Lys Glu Val Asn Met Leu Val Ser Asp Lys Thr Ala Lys  
 1665 1670 1675 1680  
 Lys Tyr Pro Gly Asp Leu Asn Gly Val Cys Glu Asn Ser Ser Ile Phe  
 1685 1690 1695  
 Glu Gly Ile Arg Glu Asp Lys Trp Ser Cys Gly Tyr Phe Cys Gly Leu  
 1700 1705 1710  
 50 Asp Ile Cys Thr Pro Asn Lys Thr Thr Gly Asp Ile His Asp Lys Gln  
 1715 1720 1725  
 Asn Ala Pro Ile Arg Val Leu Phe Lys Arg Trp Ile Glu Asn Phe Leu  
 1730 1735 1740  
 55 Lys Asp His Asn Lys Ile Lys Asp Lys Ile Ser Leu Cys Ile Asn Asn  
 1745 1750 1755 1760  
 Glu Asn Arg Asn Ile Cys Thr Asp Val Cys Arg Lys Asn Cys Glu Cys  
 1765 1770 1775  
 Ile Asp Lys Trp Ile Glu Met Lys Met Lys Glu Trp Lys Ile Val Arg



Cys Val Lys Cys Thr Gln Ala Cys Asn Thr Tyr Lys Gln Lys Ile Lys  
 2260 2265 2270  
 Lys Trp Glu Asp Gln Trp Lys Glu Ile Ser Lys Lys Tyr Lys Thr Leu  
 2275 2280 2285  
 5 Tyr Gln Gln Ala Lys Gly Ser Val Asn Gly Ala Thr Thr Ser Ser Thr  
 2290 2295 2300  
 Thr Asp Glu Lys Asp Lys Asp Val Val Asp Phe Leu Lys Met Leu His  
 2305 2310 2315 2320  
 10 Gln Lys Asn Thr Asp Asn Thr Ile Tyr Thr Thr Ala Ala Gly Phe Ile  
 2325 2330 2335  
 His Gln Glu Ala His Met Thr Asp Cys Gln Lys Gln Thr Ile Phe Cys  
 2340 2345 2350  
 Lys Asn Thr Ser Tyr Asn Asp Lys Lys Lys Tyr Ala Phe Arg His Pro  
 2355 2360 2365  
 15 Pro His Asp His Asp Asp Ala Cys Ala Cys Arg Pro Pro Ser Thr Pro  
 2370 2375 2380  
 Val Asp Val Ser Arg Lys Leu Asp Thr Gln Arg Asp Pro Lys Lys Glu  
 2385 2390 2395 2400  
 20 Glu Ser Glu Pro Glu Ser Glu Glu Glu Glu Asp Asp Ala Glu Glu Glu  
 2405 2410 2415  
 Glu Glu Pro Ala Lys Glu Thr Ala Thr Thr Glu Thr Thr Gln Pro Ala  
 2420 2425 2430  
 Ala Pro Ala Gly Pro Pro Val Thr Pro Val Pro Glu Leu Pro Gly Pro  
 2435 2440 2445  
 25 Pro Ala Pro Ala Gly Pro Ala Ala Asp Gly Pro Ile Glu Asp Asp Glu  
 2450 2455 2460  
 Asp Ala Glu Asn Glu Asp Asp Asp Asp Val Gly Ser Ala Thr Gly Thr  
 2465 2470 2475 2480  
 30 Glu Asp Asp Asp Asp Asp Glu Asp Asp Asp Asp Glu Asp Glu Glu Asp  
 2485 2490 2495  
 Ser Ala Asp Glu Gly Glu Gly Glu Gly Asp Gly Gly Asp Val Gly Glu  
 2500 2505 2510  
 Glu Glu Asp Glu Asp His Gly Gly Gln Glu Ala Glu Gly Val Val Pro  
 2515 2520 2525  
 35 Gln Pro Ala Ala Pro Gln Pro Pro Thr Pro Gln Leu Leu Asp Asp Pro  
 2530 2535 2540  
 Leu Leu Lys Thr Ala Leu Met Ser Ser Thr Ile Leu Trp Met Val Gly  
 2545 2550 2555 2560  
 40 Ile Gly Phe Ala Ala Leu Thr Tyr Phe Leu Leu Lys Lys Lys Ser Lys  
 2565 2570 2575  
 Ser Ser Val Asp Leu Leu Arg Val Leu Asn Ile Pro Lys Gly Asp Tyr  
 2580 2585 2590  
 Glu Met Pro Thr Leu Lys Ser Lys Asn Arg Tyr Ile Pro Tyr Arg Ser  
 2595 2600 2605  
 45 Gly Ser Tyr Lys Gly Lys Thr Tyr Ile Tyr Met Glu Gly Asp Ser Asp  
 2610 2615 2620  
 Ser Gly His Tyr Tyr Glu Asp Thr Thr Asp Ile Thr Ser Ser Glu Ser  
 2625 2630 2635 2640  
 50 Glu Tyr Glu Glu Leu Asp Ile Asn Glu Ile Tyr Pro Tyr Gln Ser Pro  
 2645 2650 2655  
 Lys Tyr Lys Thr Leu Ile Glu Val Val Leu Glu Pro Ser Lys Ser Asn  
 2660 2665 2670  
 Gly Asn Thr Pro Ser Lys Gly Asp Gly Asn Thr Leu Gly Asp Asp Met  
 2675 2680 2685  
 55 Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Ser Glu Leu Lys  
 2690 2695 2700  
 His Asp Phe Ile Ser Gln Tyr Ile Gln Ser Glu Pro Leu Asp Val Pro  
 2705 2710 2715 2720  
 Lys Val Gly Val Ser Lys Glu Leu Pro Met Asn Ile Gly Gly Asn Val

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2725 2730 2735  
 Leu Asp Asp Gly Ile Asn Glu Lys Pro Phe Ile Thr Ser Ile His Asp  
 2740 2745 2750  
 5 Arg Asp Leu Tyr Thr Gly Glu Glu Ile Lys Tyr Asn Ile Asn Met Gly  
 2755 2760 2765  
 Thr Asn Ser Met Asp Asp Pro Thr Tyr Val Ser Asn Asn Val Tyr Ser  
 2770 2775 2780  
 Gly Ile Asp Leu Ile Asn Asp Thr Leu Ser Gly Asn Gln His Ile Asp  
 2785 2790 2795 2800  
 10 Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu Phe Gly Thr  
 2805 2810 2815  
 Asn Tyr Lys Lys Asn Thr Ser Asn Asn Asn Val Ala Lys Leu Thr Asn  
 2820 2825 2830  
 Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Thr Trp Leu Asp  
 2835 2840 2845  
 15 Arg His Arg Asp Met Cys Glu Lys Trp Asn Lys Lys Glu Glu Leu Leu  
 2850 2855 2860  
 Asp Lys Leu Asn Glu Gln Trp Asn Lys Asp Asn Asp Gly Gly Asp Ile  
 2865 2870 2875 2880  
 20 Pro Asn Asp Asn Lys Lys Leu Asn Thr Asp Val Ser Ile Gln Ile Asp  
 2885 2890 2895  
 Ile Asp Glu Asn Lys Gly Lys Lys Glu Phe Ser Asn Met Asp Thr Asn  
 2900 2905 2910  
 Val Asp Thr Pro Thr Met Asp Ser Ile Leu Asp Asp Leu Glu Thr Tyr  
 2915 2920 2925  
 25 Asn Glu Pro Phe Tyr Asp Ile Phe Glu Asp Asp Val Tyr Tyr Asp Val  
 2930 2935 2940  
 Tyr Asp Glu Asn Pro Phe Val Asp Asp Ile Pro Met Asp His Asn Lys  
 2945 2950 2955 2960  
 30 Val Asp Val Pro Lys Lys Val His Ile Glu Met Lys Ile Leu Asn Asn  
 2965 2970 2975  
 Thr Ser Asn Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp  
 2980 2985 2990  
 Asn Ile  
 35

&lt;210&gt; 5

&lt;211&gt; 10041

40 &lt;212&gt; DNA

&lt;213&gt; Plasmodium falciparum

&lt;220&gt;

&lt;221&gt; gene

45 &lt;222&gt; (0) ... (0)

&lt;223&gt; PF13\_0003

&lt;400&gt; 5

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 50 cacaacagtg caaggggtgt tttggaagaa attggaaaaa agataaaaga taagacagaa 120  
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25/41

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55	Val	Asn	Val	Asn	Asn	Lys	Lys	Val	Ile	Thr	His	Asp	Leu	Lys	Asn	Asn
			515					520					525			
	Tyr	Glu	Asn	Cys	Asp	Leu	Phe	Lys	Lys	Leu	Gly	Glu	Gln	Lys	Trp	Lys
		530					535					540				
	Cys	Lys	Tyr	Lys	Cys	Tyr	Leu	Asp	Val	Cys	Glu	Pro	Arg	Asn	Leu	Asp
	545					550					555				560	

	Ser	Asn	Ile	Tyr	Asn	Glu	Arg	Tyr	Ile	Ser	Ile	Lys	Val	Leu	Phe	Lys	
					565					570					575		
	Arg	Trp	Leu	Glu	Tyr	Phe	Leu	Glu	Asp	Tyr	Asn	Lys	Leu	Lys	Glu	Lys	
				580					585					590			
5	Leu	Asn	Pro	Cys	Met	Tyr	Asn	Val	Gln	Glu	Ile	Val	Cys	Ile	Asn	Glu	
			595					600					605				
	Cys	Lys	Gln	Asn	Cys	Glu	Cys	Val	Glu	Lys	Trp	Ile	Lys	Glu	Lys	Arg	
		610					615					620					
	Glu	Glu	Trp	Lys	Lys	Ile	Lys	Asp	Arg	Tyr	Val	Gln	Gln	Tyr	Glu	Ser	
10		625				630					635				640		
	Lys	Asp	Glu	Asp	Val	Ser	Ser	Lys	Leu	Lys	Lys	Phe	Leu	Lys	Gln	Glu	
					645				650						655		
	Leu	Phe	Thr	Asn	Tyr	Val	Lys	Asn	Ala	Leu	Asp	Lys	Asp	Glu	Thr	Leu	
				660					665					670			
15	Asp	Ser	Met	Lys	Glu	Ser	Thr	Glu	Cys	Ile	Asp	Pro	Asn	Lys	Pro	Lys	
			675					680					685				
	Gly	Lys	Pro	Cys	Asn	Asn	Asn	Asp	Val	Ile	Asn	Ile	Leu	Leu	Asn	Arg	
		690					695					700					
20	Leu	Glu	Lys	Gln	Ile	Asp	Asn	Cys	Lys	Lys	Lys	His	Glu	Glu	Lys	Gly	
		705				710					715				720		
	Glu	Lys	Pro	Cys	Val	Asp	Ile	Pro	Lys	Leu	Leu	Asn	Asp	Glu	Asp	Glu	
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	Asp	Glu	Asp	Asp	Glu	Thr	Pro	Arg	Ala	His	Asn	Pro	Cys	Val	Asp		
				740				745					750				
25	Lys	Asn	Asp	Ser	Gln	Pro	Thr	Lys	Thr	Val	Ser	Tyr	Ile	Ala	Arg	Gln	
			755					760					765				
	Met	His	Arg	Arg	Ala	Lys	Ala	Gln	Met	Thr	Lys	Asn	Ser	Val	Val	Asp	
		770					775					780					
30	Gly	Asp	Asn	Lys	Leu	Glu	Gly	Asp	Ile	Phe	Lys	Val	Thr	Phe	Arg	Asn	
		785					790				795				800		
	Gly	Gly	Val	Gly	Lys	Asn	Leu	Asn	Gly	Asp	Ile	Cys	Lys	Ile	Asp	Lys	
					805				810						815		
	Thr	Tyr	Ser	Asn	Asp	Ser	Arg	Gly	Thr	Pro	Thr	Asp	Gly	Pro	Cys	Glu	
				820				825					830				
35	Gly	Lys	Gly	Asp	Arg	Phe	Lys	Ile	Gly	Thr	Asp	Trp	Gln	Gly	Asp	Ser	
			835					840					845				
	Phe	Val	Asn	Pro	Gln	Tyr	Arg	Gly	Ile	Tyr	Met	Pro	Pro	Arg	Arg	Gln	
		850					855					860					
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	Arg	Asn	Gly	Asn	Ala	Ser	Asn	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu	Ala	
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	Ala	Lys	Tyr	Glu	Ala	Glu	Arg	Thr	Lys	Asn	His	Tyr	Val	Ser	Lys	Lys	
				900				905					910				
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			915					920					925				
	Leu	Gly	Asp	Ile	Ile	Arg	Gly	Lys	Asp	Met	Trp	Asp	Lys	Asn	His	Gly	
		930					935					940					
50	Glu	Lys	Lys	Thr	Gln	Glu	Asn	Leu	Glu	Arg	Ile	Phe	Ala	Lys	Ile	Lys	
		945				950					955				960		
	Glu	Gln	Leu	Leu	Asn	Ser	Ser	Ile	Lys	Asp	Lys	Tyr	Lys	Asp	Asp	Asp	
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	Lys	Ala	Thr	Pro	Lys	Tyr	Lys	Gln	Leu	Arg	Glu	Asp	Trp	Trp	Glu	Ala	
				980				985					990				
55	Asn	Arg	Ser	Gln	Val	Trp	Glu	Ala	Met	Gln	Cys	Pro	Pro	Lys	Asn	Gly	
			995				1000					1005					
	Thr	Phe	Pro	Cys	Lys	Ser	Asp	His	Thr	Pro	Leu	His	Asp	Tyr	Ile	Pro	
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	Pro Ala Cys Glu Lys Tyr Lys Lys Phe Ile Asn Thr Trp Gln Pro Gln						
		1075		1080		1085	
	Trp Lys Gln Met Glu Gln Lys Tyr Ser Gln Leu Tyr Glu Glu Ala Lys						
		1090		1095		1100	
10	Lys Tyr Asn Asp Ser Ser Arg Lys Asp Thr Thr Asn Lys Asp Asp Tyr						
		1105		1110		1115	1120
	Val Leu Gln Phe Leu Asn Lys Leu Leu Thr Gln Asn Lys Gly Asn Lys						
		1125		1130		1135	
	Thr Tyr Asp Thr Ala Glu Gly Tyr Val His Gln Glu Ala His Ile Ser						
15		1140		1145		1150	
	Asp Cys Gln Lys Gln Thr Gln Phe Cys Lys Lys Arg Asn Gly Glu Ile						
		1155		1160		1165	
	Pro Ser Ser Asp Thr Glu Thr Asp Asn Asn Tyr Ala Phe Arg Pro Gln						
		1170		1175		1180	
20	Pro His Asp His Asp Glu Val Cys Glu Cys Asn Thr Arg Gln Lys Thr						
		1185		1190		1195	1200
	Lys Val Arg Lys Lys Lys Lys Lys Val Asp Ala Cys Glu Met Ala Lys						
		1205		1210		1215	
	Thr Leu Leu His Asn Asn Asp Gly Thr Ile Arg Ile Gly Gln Cys Lys						
25		1220		1225		1230	
	Arg Lys Asp Glu Gly Asn Ala Glu Tyr Pro Lys Trp Asp Cys Asn Ser						
		1235		1240		1245	
	Gln Ile His Thr Thr His Asn Gly Ala Cys Met Pro Pro Arg Arg Gln						
		1250		1255		1260	
30	Lys Leu Cys Val Tyr Phe Phe Ala Asn Pro Ser Gln Ile Gly Ser Ile						
		1265		1270		1275	1280
	Asn Lys Gln Asp Asn Leu Arg Lys Ala Phe Ile Ile Ser Ala Ala Ala						
		1285		1290		1295	
	Glu Thr Phe Arg Ser Trp Gln Tyr Tyr Lys Ser Lys Asn Gly Gly Glu						
35		1300		1305		1310	
	Asn Leu Gln Thr Gln Leu Lys Asp Gly Thr Ile Pro Asp Asp Phe Lys						
		1315		1320		1325	
	Arg Gln Met Phe Tyr Thr Tyr Gly Asp Tyr Arg Asp Phe Leu Phe Gly						
		1330		1335		1340	
40	Thr Asp Ile Ser Lys Gly Leu Gly Glu Gly Thr Ala Leu Glu Lys Gln						
		1345		1350		1355	1360
	Ile Asn Ile Leu Phe Pro Asn Gly Val Arg Lys Ile Pro Asn Glu Lys						
		1365		1370		1375	
	Thr Arg Glu Lys Trp Trp Thr Asp His Gly Pro Glu Ile Trp Lys Gly						
45		1380		1385		1390	
	Met Leu Cys Ala Leu Thr Asn Gly Leu Ser Glu Ser Glu Lys Lys Thr						
		1395		1400		1405	
	Lys Ile Phe Asp Asp Tyr Ser His Asp Lys Val Asn Gln Ser Lys Asn						
		1410		1415		1420	
50	Gly Asn Pro Ser Leu Glu Asp Phe Ala Lys Lys Pro Gln Phe Phe Arg						
		1425		1430		1435	1440
	Trp Phe Ile Glu Trp Ser Asp Glu Phe Cys Arg Glu Arg Lys Lys Lys						
		1445		1450		1455	
	Glu Glu Glu Val Glu Arg Asp Cys Lys Asp Glu Tyr Glu Gly Cys Glu						
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	Lys Glu Lys Asn Gly Lys Cys Val Thr Ala Cys Lys Ala Tyr Lys Glu						
		1475		1480		1485	
	Tyr Ile Thr Asn Lys Lys Glu Glu Tyr Asp Ser Gln Lys Gly Lys Phe						
		1490		1495		1500	

Asp Val Glu Lys Thr Glu Lys Lys Gln Gly Tyr Glu Asp Tyr Ser Glu  
 1505 1510 1515 1520  
 Lys Gln Ala Ser Glu Tyr Leu Lys Glu Lys Cys Ile Lys Ser Ser Cys  
 1525 1530 1535  
 5 Asn Cys Met Lys Lys Val Thr Glu Ile Ser Asn Tyr Trp Thr Asn Pro  
 1540 1545 1550  
 His Lys Thr Tyr Asp Thr Glu Asn Leu Gly Ile Lys Cys Glu Cys Pro  
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 10 Pro Ser Pro Cys Thr Ile Val Asp Gly Ile Leu Ser Pro Gln Asn Ser  
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 Ser Ser Tyr Ala Glu Gly Cys Lys Trp Lys Tyr Gly Lys Met Ser Gln  
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 Gly Gly Thr Glu Trp Asp Cys Ser Lys Lys Ser Gly Gly Glu Gly Gly  
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 15 Asn Glu Asp Gly Asp Val Val Cys Ile Pro Pro Arg Arg Arg Arg Leu  
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 1700 1705 1710  
 Tyr Thr Phe Ala Asp Tyr Arg Asp Ile Cys Leu Gly Lys Asp Ile Gly  
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 40 Gly Pro Ile Gly Asn Thr Lys Leu Glu Lys Phe Ala Ser Arg Pro Pro  
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 Phe Phe Arg Trp Leu Glu Glu Trp Ala Asp Glu Phe Cys Arg Lys Arg  
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 Thr His Lys Leu Glu Lys Ile Gln Asn Glu Cys Lys Gly Val Ser Gly  
 1845 1850 1855  
 45 Thr Asn Gln Cys Asp Asp Asp Gly Phe Asp Cys Asp Glu Met Cys Pro  
 1860 1865 1870  
 Lys Lys Asp Gly Ser Phe Glu Thr Phe Lys Cys Leu Ser Cys Ala Lys  
 1875 1880 1885  
 50 Ser Cys Arg Phe Tyr Lys Lys Trp Ile Ser Arg Lys Lys Glu Glu Phe  
 1890 1895 1900  
 Asp Lys Gln Ser Lys Lys Tyr Glu Asn Glu Ile Asp Asp Val Lys His  
 1905 1910 1915 1920  
 Asn Ser Asp Asn Ile Tyr Gly Lys Asp Phe Leu Glu Thr Leu Asp Gln  
 1925 1930 1935  
 55 Gln Tyr Lys Ser Val Glu Leu Phe Leu Glu Lys Val Lys Gly Pro Cys  
 1940 1945 1950  
 Ser Ile Asn Asn Asn Asn Glu Glu Cys Lys Ile Asp Phe Asn Lys Pro  
 1955 1960 1965  
 Lys Asp Thr Phe Gly His Ala Lys Asn Cys Gly Pro Cys Ser Glu Ile

		1970				1975					1980						
		Arg	Phe	Lys	Cys	Ile	Glu	Asp	Asn	Ser	Asn	Trp	Val	Thr	Thr	Asn	Thr
		1985					1990					1995					2000
		Cys	Asn	Lys	Thr	Thr	Phe	Lys	Phe	Thr	Glu	Asp	Asn	Lys	Asp	Thr	Lys
5						2005					2010					2015	
		Glu	Asp	Ser	Glu	Gln	Leu	Gly	Met	Leu	Ile	Ser	Asp	Asn	Thr	Val	Gln
					2020					2025					2030		
		Asn	Phe	Ala	Asp	Gly	Leu	Gln	Asn	Asp	Cys	Lys	Asp	Ala	Asp	Ile	Phe
				2035					2040					2045			
10		Lys	Gly	Leu	Arg	Lys	Asp	Gln	Trp	Ser	Cys	Gly	Tyr	Phe	Cys	Asn	Leu
			2050					2055					2060				
		Asp	Ile	Cys	Ser	Leu	Lys	Thr	Ser	His	Gly	Glu	Asn	Asn	Tyr	Lys	Gln
		2065					2070					2075					2080
		Asn	Ile	Leu	Ile	Arg	Ala	Leu	Phe	Lys	Arg	Trp	Leu	Glu	His	Phe	Leu
15						2085					2090					2095	
		Glu	Asp	Tyr	Asn	Lys	Ile	Asn	Asp	Lys	Ile	Ser	His	Cys	Met	Lys	Asn
					2100					2105					2110		
		Gly	Glu	Gly	Ser	Thr	Cys	Ile	Lys	Gly	Cys	Glu	Ile	Lys	Cys	Asn	Cys
				2115					2120					2125			
20		Val	Ser	Asn	Trp	Ile	Lys	Lys	Lys	Thr	Leu	Glu	Trp	Glu	Ile	Val	Arg
			2130					2135					2140				
		Asp	Arg	Phe	Phe	Lys	Gln	Tyr	Asn	Val	Asp	Ser	Glu	Lys	Ser	Phe	Thr
		2145					2150					2155					2160
		Val	Lys	Ser	Phe	Leu	Glu	Gln	Ala	Pro	Phe	Asp	Ser	Asp	Val	Gln	Lys
25						2165					2170					2175	
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					2180					2185					2190		
		Cys	Asn	Gly	Thr	Thr	Ser	Ala	Arg	Lys	Glu	Lys	Gly	Thr	Glu	Lys	Asp
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30		Val	Val	Ile	Cys	Leu	Leu	Asp	Lys	Leu	Gln	Lys	Gln	Ile	Glu	Thr	Cys
			2210					2215					2220				
		Gln	Thr	Lys	His	Lys	Glu	Thr	Ser	Gly	Asn	Thr	Cys	Ser	Pro	Pro	Pro
		2225					2230					2235					2240
		Asn	Pro	Asp	Thr	Gln	Thr	Asp	Thr	Pro	Leu	Pro	Leu	Glu	Ser	Phe	Pro
35						2245					2250					2255	
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		2305					2310					2315					2320
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					2340					2345					2350		
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			2355						2360					2365			
50		Glu	Thr	Gln	Trp	Lys	Asp	Thr	Gly	Lys	Ser	Gly	Lys	His	Val	Asp	Val
			2370					2375					2380				
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		2385					2390					2395					2400
		Leu	Leu	Lys	Gly	Asn	Ser	Asp	Gln	Ile	Met	Lys	Val	Gly	Asn	Asn	Lys
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 5 Leu Glu Arg Asp Leu Val Lys Ile Phe Gly Lys Ile Lys Glu Gly Ile  
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 Asp Thr Thr Thr Val Thr Pro Leu Val Asp Tyr Ile Pro Gln Arg Leu  
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 15 Arg Trp Met Met Glu Trp Ala Glu Trp Tyr Cys Lys Tyr Gln Ser Lys  
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 Ala Tyr Ser Glu Leu Arg Lys Gly Cys Glu Asp Cys Arg Ser Trp Lys  
 2580 2585 2590  
 Cys Met Lys Gly Asp Ser Lys Cys Glu Asn Cys Thr Lys Ala Cys Lys  
 2595 2600 2605  
 20 Asp Tyr Asn Ser Lys Ile Glu Pro Trp Lys Gln Gln Trp Thr Lys Ile  
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 Lys Glu Lys Tyr Glu Glu Leu Tyr Lys Lys Ala Gln Asn Ser Asp Thr  
 2625 2630 2635 2640  
 25 Ser Asn Ser Gly Thr Thr Tyr Pro Lys Asp Glu Lys Asp Val Val Ser  
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 Phe Leu Ser Lys Leu His Glu Lys Asn Lys Asp Asn Lys Ile Tyr Tyr  
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31/41

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 45 3265 3270 3275 3280  
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 Asn Ile  
 55 3345

&lt;210&gt; 7

&lt;211&gt; 9473

&lt;212&gt; DNA

&lt;213&gt; Plasmodium falciparum

&lt;220&gt;

5 &lt;221&gt; gene

&lt;222&gt; (0)...(0)

&lt;223&gt; var gene PFD1235w codon optimised

&lt;400&gt; 7

```

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   aaggagcagg cctccaagga cgccaagatc cacggacacc acctgaaggg cgacctggcc 180
   aaggccgtgt tcaggcacc cttctccgcc tacaggccca actacggcaa cccctgcgag 240
   ctggactacc gcttccacac caacgtgtgg cacaggaacg ccgaggacag gaacccctgc 300
15 ctgtttctcca gggccaagcg cttctccaac gagggagagg ccgagtgcaa cggcggcac 360
   atcacccgaa acaagggaga gtgcggcgcc tgcgccccct acaggaggag gcacatctgc 420
   gactacaacc tgcaccacat caacgagaac aacatccgca acaccacga cctgctgggc 480
   aacctgctgg tgatggcccc ctccgagggg gagtccatcg tgaagtccca cgagtacacc 540
   ggctacggca tctacaagtc cggcatctgc acctccctgg cccgctcttt cgccgacatc 600
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25	Thr	Ile	Tyr	Lys	Asn	Glu	Asn	Gly	Asn	Thr	Asn	Asn	Tyr	Tyr	Lys	Lys
					645					650					655	
	Leu	Asn	Asn	His	Phe	Gln	Gly	Tyr	Phe	Phe	His	Val	Met	Lys	Glu	Leu
				660					665					670		
30	Asn	Lys	Glu	Glu	Lys	Trp	Tyr	Lys	Leu	Met	Glu	Asp	Leu	Lys	Glu	Lys
			675					680					685			
	Ile	Asp	Ser	Ser	Asn	Leu	Lys	Asn	Gly	Thr	Lys	Asp	Ser	Glu	Gly	Ala
		690					695					700				
	Ile	Lys	Val	Leu	Phe	Asp	His	Leu	Lys	Asp	Ile	Ala	Glu	Arg	Cys	Ile
	705					710					715					720
35	Asp	Asn	Asn	Ser	Lys	Asp	Ser	Cys	Pro	Pro	Ser	Val	Asp	Thr	Lys	Thr
					725					730					735	
	Asn	Pro	Cys	Ala	Lys	Pro	Pro	Gly	Ser	Lys	Pro	Thr	Lys	Ser	Val	Lys
				740					745					750		
40	Gln	Leu	Ala	Glu	His	Met	Gln	Gln	Lys	Ala	Gln	Lys	Leu	Gly	Thr	
			755					760					765			
	Arg	Gly	Gly	Glu	Ser	Lys	Leu	Lys	Gly	Asp	Ala	Thr	Arg	Gly	Thr	Tyr
		770					775					780				
	Asn	Leu	Gly	Gly	Gln	Gly	Asn	Thr	Leu	Asn	Gly	Asp	Ile	Cys	Lys	Ile
	785					790					795					800
45	Thr	Lys	Asn	His	Thr	Asn	Asp	Ser	Arg	Pro	Asn	Gly	Glu	Pro	Cys	Thr
					805					810					815	
	Gly	Lys	Asp	Lys	Val	Lys	Asn	Gly	Phe	Arg	Leu	Lys	Ile	Gly	Thr	Pro
				820					825					830		
50	Trp	Thr	Asn	Ile	Val	Gln	Lys	Lys	Lys	Lys	Ser	Tyr	Asn	Lys	Asp	Phe
			835					840					845			
	Tyr	Leu	Pro	Pro	Arg	Arg	Gln	His	Met	Cys	Thr	Ser	Asn	Leu	Glu	Asn
		850					855					860				
	Leu	Ser	Thr	Ser	Ser	Lys	Gly	Leu	Ser	Asn	Gly	Ser	Phe	Ala	Ser	His
	865					870					875					880
55	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu	Ala	Ala	Lys	Phe	Glu	Ala	Gln	Lys
					885					890					895	
	Ile	Ile	Leu	Val	Tyr	Lys	Asn	Lys	Asn	Asn	Ile	Asn	Ile	Arg	Lys	Arg
				900						905				910		
	Ile	Thr	Asp	Pro	Asn	Asp	Gln	Ala	Thr	Val	Cys	Arg	Ala	Ile	Arg	Tyr

		915				920				925						
	Ser	Phe	Ala	Asp	Leu	Gly	Asp	Ile	Ile	Arg	Gly	Lys	Asp	Met	Trp	Asn
		930					935					940				
	Ile	Asn	Ser	Asp	Ala	Lys	Asp	Leu	Gln	Asp	Arg	Leu	Glu	Lys	Ile	Phe
5	945					950					955					960
	Lys	Thr	Ile	Asn	Glu	Lys	Leu	Pro	Asn	Glu	Ile	Gln	Lys	Arg	Tyr	Thr
					965					970						975
	Asn	Arg	Glu	Asn	Lys	His	Leu	Asp	Leu	Arg	Ser	Asp	Trp	Trp	Glu	Ala
				980					985					990		
10	Asn	Arg	His	Gln	Val	Trp	Arg	Ala	Met	Lys	Cys	Ala	Thr	Lys	Gly	Ile
		995						1000						1005		
	Ser	Asn	Asn	Asn	Cys	Asn	Gly	Ile	Pro	Ile	Glu	Asp	Tyr	Ile	Pro	Gln
		1010					1015					1020				
	Arg	Leu	Arg	Trp	Met	Thr	Glu	Trp	Ala	Glu	Trp	Tyr	Cys	Lys	Lys	Gln
15	1025					1030					1035					1040
	Ser	Gln	Glu	Tyr	Glu	Lys	Leu	Glu	Glu	Lys	Cys	Gly	Met	Cys	Thr	Gly
					1045					1050						1055
	Lys	Gly	Gln	Gly	Asp	Gly	Lys	Asp	Cys	Thr	Gln	Lys	Asp	Lys	Glu	Cys
				1060					1065					1070		
20	Ser	Pro	Cys	Lys	Lys	Ala	Cys	Asp	Ala	Tyr	Lys	Lys	Glu	Ile	Glu	Lys
		1075						1080						1085		
	Trp	Glu	Lys	Gln	Trp	Lys	Thr	Val	Ser	Ala	Ile	Tyr	Gln	Ile	Leu	Tyr
		1090					1095						1100			
	Ala	Lys	Ala	Arg	Ile	Val	Ala	Ser	Asn	Gly	Gly	Pro	Gly	Tyr	Tyr	Asn
25	1105					1110					1115					1120
	Thr	Glu	Val	Gln	Lys	Lys	Asp	Arg	Ser	Val	Tyr	Asp	Phe	Leu	Tyr	Glu
					1125					1130						1135
	Leu	His	Leu	Gln	Asn	Gly	Gly	Lys	Lys	Gly	Pro	Pro	Pro	Ala	Thr	His
				1140					1145					1150		
30	Pro	Tyr	Lys	Ser	Val	Asn	Thr	Arg	Asp	Lys	Arg	Asp	Ala	Thr	Asp	Asp
		1155						1160					1165			
	Thr	Thr	Pro	Thr	Val	Tyr	Ser	Thr	Ala	Ala	Gly	Tyr	Val	His	Gln	Glu
		1170					1175						1180			
	Ala	His	Ile	Gly	Asp	Cys	Lys	Glu	Gln	His	Val	Phe	Cys	Asp	Asn	Asn
35	1185					1190					1195					1200
	Gly	Asn	Lys	Glu	Lys	Tyr	Ala	Phe	Lys	Asn	Pro	Pro	Asn	Val	Tyr	Val
					1205					1210						1215
	Glu	Ala	Cys	Lys	Cys	Met	Thr	Arg	Glu	Ala	Pro	Pro	Pro	Pro	Thr	Thr
				1220					1225					1230		
40	Pro	Ser	Thr	Pro	Asn	Pro	Cys	Ala	Glu	Thr	Gly	Gly	Val	His	Thr	Ile
		1235						1240					1245			
	Lys	Thr	Val	Thr	Asp	Val	Ala	Lys	Ile	Leu	Gln	Gly	Glu	Ala	Asn	Glu
		1250					1255					1260				
	Thr	Met	Leu	Lys	Asn	Ser	Ser	Asn	Gly	Asn	Asp	Lys	Asp	Glu	Ser	Lys
45	1265					1270					1275					1280
	Leu	Lys	Gly	Lys	Ala	Glu	Glu	Gly	Asp	Tyr	Ser	Arg	Gly	Gly	Thr	Pro
					1285					1290						1295
	Ser	Asp	Phe	Asn	Asn	Asn	Leu	Cys	Gly	Ile	Thr	Gln	Lys	His	Ser	Asn
				1300					1305					1310		
50	Ala	His	Asn	Asp	Ser	Gln	Gln	Pro	Cys	Tyr	Gly	Lys	Asp	Gln	Lys	Arg
		1315						1320					1325			
	Phe	Asn	Val	Gly	Thr	Glu	Trp	Ser	Phe	Lys	Asp	Asn	His	Arg	Lys	Arg
		1330					1335					1340				
	Thr	His	Pro	Glu	Ala	Tyr	Met	Pro	Pro	Arg	Arg	Glu	His	Ile	Cys	Thr
55	1345					1350					1355					1360
	Ser	Asn	Leu	Glu	Tyr	Leu	Ile	His	Lys	Arg	Lys	Lys	Pro	Ile	Ile	Glu
					1365					1370						1375
	Gly	Asp	Pro	Asn	Lys	Ile	Ile	His	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu
				1380					1385					1390		

Ala Ala Lys Tyr Glu Ala Glu Asn Ile Lys Lys Leu Tyr Glu Glu Asn  
                   1395                                  1400                                  1405  
 Asn Asn Arg Lys Asp Gln Glu Gly Ile Cys Arg Ala Met Lys Tyr Ser  
                   1410                                  1415                                  1420  
 5 Phe Ala Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Ile Glu  
    1425                                  1430                                  1435                                  1440  
 Asn Asn Asp Ala Lys Arg Leu Gln Thr Asn Leu Lys Glu Ile Phe Thr  
                                   1445                                  1450                                  1455  
 Lys Ile Lys Glu Lys Thr Gly Gly Thr Thr Tyr Asn Glu Asp Asn Asp  
 10                                  1460                                  1465                                  1470  
 Pro Tyr Leu Lys Leu Arg Ala Asp Trp Trp Glu Ala Asn Arg Ala Lys  
                   1475                                  1480                                  1485  
 Val Trp Lys Ala Met Lys Cys Lys Thr Asn Gly Val Asp Ile Thr Cys  
                   1490                                  1495                                  1500  
 15 Asp Ser Asp His Thr Pro Leu Asp Asp Tyr Ile Pro Gln Arg Leu Arg  
    1505                                  1510                                  1515                                  1520  
 Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Ala Gln Ser Gln Glu  
                                   1525                                  1530                                  1535  
 Tyr Lys Lys Leu Glu Glu Lys Cys Ser Gln Cys Lys Ser Lys Gly Lys  
 20                                  1540                                  1545                                  1550  
 Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys  
                   1555                                  1560                                  1565  
 Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln  
                   1570                                  1575                                  1580  
 25 Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln  
    1585                                  1590                                  1595                                  1600  
 Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys  
                                   1605                                  1610                                  1615  
 Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu  
 30                                  1620                                  1625                                  1630  
 Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His  
                   1635                                  1640                                  1645  
 Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp  
                   1650                                  1655                                  1660  
 35 Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro  
    1665                                  1670                                  1675                                  1680  
 His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu  
                                   1685                                  1690                                  1695  
 Glu Pro Lys Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val  
 40                                  1700                                  1705                                  1710  
 Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp  
                   1715                                  1720                                  1725  
 His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp  
                   1730                                  1735                                  1740  
 45 Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met  
    1745                                  1750                                  1755                                  1760  
 Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn  
                                   1765                                  1770                                  1775  
 Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala  
 50                                  1780                                  1785                                  1790  
 Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn  
                   1795                                  1800                                  1805  
 Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp  
                   1810                                  1815                                  1820  
 55 Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys  
    1825                                  1830                                  1835                                  1840  
 Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly  
                                   1845                                  1850                                  1855  
 Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr

				1860					1865					1870		
	Asn	Val	Glu	Gln	Arg	Lys	Pro	Trp	Trp	Gly	Lys	Asn	Ala	Glu	Ala	Ile
			1875						1880					1885		
5	Trp	Asp	Gly	Met	Leu	Cys	Ala	Leu	Ser	Tyr	Asn	Thr	Thr	Asn	Lys	Asn
		1890					1895					1900				
	Met	Asp	Tyr	Asn	Ala	His	Thr	Lys	Leu	Asn	Pro	Thr	Tyr	Gly	Tyr	Asn
		1905				1910					1915					1920
	Ala	Ile	Lys	Ser	Glu	Leu	Glu	Asp	Phe	Val	Asn	Arg	Pro	Gln	Phe	Leu
				1925						1930					1935	
10	Arg	Trp	Phe	Thr	Glu	Trp	Ser	Asp	Glu	Phe	Cys	Thr	Glu	Arg	Ser	Ile
				1940					1945					1950		
	Lys	Ile	Lys	Glu	Leu	Glu	Thr	Lys	Cys	Asn	Asp	Cys	Thr	Val	Ser	Glu
		1955						1960					1965			
	Ser	Gly	Thr	Ser	Asp	Ala	Thr	Gly	Asn	Lys	Thr	Cys	Asp	Asp	Lys	Asp
15		1970					1975					1980				
	Lys	Cys	Asp	Glu	Cys	Lys	Arg	Ala	Cys	Thr	Thr	Tyr	Lys	Thr	Trp	Leu
		1985				1990					1995					2000
	Lys	Asn	Trp	Lys	Thr	Gln	Tyr	Lys	Thr	Gln	Ser	Lys	Lys	Tyr	Phe	Asp
				2005						2010					2015	
20	Asp	Lys	Arg	Lys	Glu	Leu	Tyr	Lys	Ser	Ile	Asp	Asp	Val	Ala	Ser	Ser
				2020					2025					2030		
	Thr	Gln	Ala	Tyr	Gln	Tyr	Leu	His	Ala	Gln	Leu	Lys	Lys	Leu	Cys	Gly
		2035						2040					2045			
	Asn	Ala	Asp	Cys	Lys	Cys	Met	Asp	Gly	Glu	Ser	Lys	Glu	Thr	Thr	Gly
25		2050					2055					2060				
	Gln	Pro	Asp	Asn	Ser	His	Asp	Ser	His	Met	Pro	Ala	Ser	Leu	Asp	Asp
		2065				2070				2075						2080
	Glu	Pro	Glu	Glu	Val	Asn	Gly	Lys	Cys	Asn	Cys	Lys	Val	Lys	His	Arg
				2085						2090					2095	
30	Pro	Gln	Pro	Pro	Leu	Ala	Leu	Pro	Pro	Pro	Ala	Pro	Ser	Gly	Pro	Pro
				2100					2105					2110		
	Ala	Glu	Asp	Gln	Ile	Glu	His	Asp	Asn	Arg	Gly	Arg	Ser	Glu	Arg	Gly
		2115						2120					2125			
	Asp	Gln	Gly	Pro	Leu	Pro	Ala	Arg	Pro	Pro	Pro	Pro	Pro	Gln	Ala	Ala
35		2130					2135				2140					
	Gln	Pro	Pro	Gln	Pro	Lys	Pro	Lys	Arg	Thr	Gly	Glu	Gly	Leu	Gly	Arg
		2145				2150				2155						2160
	Asn	Leu	Pro	Pro	Ala	Asp	Arg	Asn	Thr	Asn	Leu	Ser	Asp	Ser	Glu	Glu
				2165					2170						2175	
40	Glu	Asp	Asp	Glu	Asp	Asp	Asp	Glu	Val	Gln	Glu	Glu	Glu	Glu	Thr	Pro
				2180					2185					2190		
	Pro	Ser	Glu	Ala	Glu	Glu	Gly	Glu	Gly	His	Val	Glu	Thr	Glu	Glu	Glu
		2195						2200					2205			
	Thr	Lys	Pro	Val	Lys	Glu	Lys	Thr	Glu	Gly	Ala	Gly	Ala	Thr	Glu	Val
45		2210					2215					2220				
	Thr	Lys	Gln	Gly	Ser	Ala	Pro	Thr	Ala	Thr	Thr	Pro	Thr	Val	Glu	Asp
		2225				2230				2235						2240
	Ile	Cys	Ala	Thr	Val	Ala	Lys	Ala	Leu	Lys	Gly	Asp	Lys	Ser	Leu	Asn
				2245					2250						2255	
50	Ala	Ala	Cys	Ala	Leu	Lys	Tyr	Gly	Lys	Asn	Asn	Ser	Arg	Leu	Gly	Trp
				2260					2265					2270		
	Lys	Cys	Ile	Pro	Thr	Ser	Gly	Asp	Lys	Thr	Asp	Thr	Ser	Glu	Asn	Gly
		2275						2280					2285			
	Ala	Pro	Arg	Arg	Ala	Arg	Ser	Ala	His	Gly	Gly	Lys	Ser	Asp	Ser	Glu
55		2290					2295					2300				
	Lys	Gly	Ser	Ile	Cys	Val	Pro	Pro	Arg	Arg	Arg	Arg	Leu	Tyr	Ile	Lys
		2305				2310				2315						2320
	Lys	Ile	Val	Asp	Trp	Ala	Glu	Ser	Gln	Ser	Lys	Thr	Val	Thr	Ser	Val
				2325					2330						2335	

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	Asn	Gly	Asp	Gly	Asn	Gly	Ser	Gln	Glu	Val	Val	Ser	Val	Asn	Gly	Ala	
				2340					2345					2350			
	Ser	Glu	Ser	Gly	Gly	Ser	Gly	Ser	Gly	Thr	Glu	Ser	Gln	Ala	Ser	Asp	
			2355					2360						2365			
5	Val	Ser	Gln	Gly	Asn	Gly	Ala	Ser	Thr	Ser	Pro	Gln	Val	Ala	Leu	Leu	
			2370				2375						2380				
	His	Ala	Phe	Val	Lys	Ser	Ala	Ala	Ile	Glu	Thr	Phe	Phe	Ala	Trp	His	
						2390						2395				2400	
	Lys	Tyr	Lys	Val	Asp	Lys	Glu	Ile	Glu	Glu	Lys	Glu	Lys	Gln	Ala	Ala	
10					2405					2410					2415		
	Gln	Asn	His	Leu	Val	Gln	Arg	Lys	Thr	Ser	Glu	Asn	Pro	Gln	Lys	Lys	
				2420					2425					2430			
	Leu	Glu	Gly	Gly	Glu	Ile	Pro	Glu	Asp	Phe	Lys	Arg	Gln	Met	Phe	Tyr	
			2435					2440					2445				
15	Thr	Leu	Gly	Asp	Tyr	Arg	Asp	Ile	Leu	Val	Gly	Asp	Lys	Thr	Met	Ile	
			2450				2455					2460					
	Glu	Ala	Leu	Glu	Lys	Ser	Gly	Asp	Thr	Lys	Ile	Glu	Asp	Ile	Ser	Glu	
			2465				2470				2475					2480	
	Lys	Ile	Pro	Lys	Ile	Leu	Asp	Gly	Glu	Asn	Asn	Lys	Ala	Ala	Gly	Gly	
20					2485					2490					2495		
	Gly	Pro	Lys	Gln	Pro	Asn	Ser	Gly	Lys	Thr	Pro	Gln	Glu	Trp	Trp	Lys	
				2500					2505					2510			
	Glu	Asn	Ala	Lys	His	Ile	Trp	His	Gly	Met	Ile	Cys	Ala	Leu	Thr	Tyr	
			2515					2520				2525					
25	Asn	Thr	Asp	Ser	Asn	Gly	Lys	Asp	Lys	Lys	Ile	Gln	Gln	Val	Lys	Ala	
			2530				2535					2540					
	Thr	Asp	Asn	Thr	Asp	Leu	Phe	Gln	Lys	Leu	Lys	Lys	Asp	Asn	Asp	Tyr	
			2545				2550				2555					2560	
	Glu	Thr	Val	Ser	Phe	Gly	Ala	Ser	Gly	Thr	Gly	Ala	Lys	Ser	Asn	Asp	
30					2565					2570					2575		
	Asp	Thr	Lys	Leu	Lys	Asn	Phe	Val	Val	Arg	Pro	Thr	Tyr	Phe	Arg	Trp	
			2580						2585					2590			
	Leu	Glu	Glu	Trp	Gly	Glu	Glu	Phe	Cys	Arg	Lys	Gln	Lys	His	Lys	Leu	
			2595					2600					2605				
35	Tyr	Ile	Ile	Lys	Lys	Asp	Cys	Arg	Asp	Asn	Lys	Phe	Cys	Ser	Gly	Asp	
			2610				2615					2620					
	Gly	Leu	Arg	Cys	Asp	Glu	Lys	Val	Pro	Asp	Lys	Lys	Asp	Ile	Phe	Lys	
			2625				2630				2635					2640	
	His	Phe	Asp	Cys	Pro	Ser	Cys	Ala	Arg	His	Cys	Arg	Ser	Tyr	Arg	Lys	
40					2645					2650					2655		
	Trp	Ile	Glu	Arg	Lys	Lys	Thr	Glu	Tyr	Glu	Lys	Gln	Glu	Ser	Ala	Tyr	
			2660					2665					2670				
	Ser	Lys	Gln	Lys	Ser	Asn	Tyr	Val	Asn	Gly	Ser	Asn	Gly	Asp	Gly	Gly	
			2675					2680					2685				
45	Asn	Asn	Asn	Asp	Lys	Glu	Phe	Tyr	Thr	Lys	Leu	Glu	Thr	Cys	Thr	Lys	
			2690				2695					2700					
	Ala	Thr	Asn	Phe	Leu	Glu	Ser	Leu	Lys	Gly	Gln	Cys	Ile	Gly	Asn	Asn	
			2705				2710				2715					2720	
	Asn	Gly	Gly	Thr	Asp	Ile	Lys	Phe	Ser	Asn	Thr	Asn	Ile	Thr	Phe	Gly	
50					2725					2730					2735		
	Ser	Ala	Glu	Asp	Cys	Lys	Pro	Cys	Ser	Glu	Phe	Lys	Val	Asn	Cys	Glu	
			2740					2745					2750				
	Asn	Gly	Ser	Cys	Gly	Ser	Ala	Lys	Gln	Lys	Asp	Cys	Pro	Asn	Asn	Thr	
			2755					2760					2765				
55	Ile	Thr	Ser	Gln	Asn	Ile	Lys	Gly	Leu	Thr	Asp	Gln	Val	Asp	Met	Arg	
			2770				2775					2780					
	Val	Ser	Asp	Asn	Thr	Glu	Ser	Gly	Phe	Glu	Gly	Asp	Leu	Gly	Ile	Cys	
			2785				2790				2795					2800	
	Gln	Gly	Ala	Gly	Ile	Phe	Lys	Gly	Ile	Arg	Lys	Asp	Glu	Trp	Lys	Cys	



				2805				2810				2815				
	Gly	Asp	Phe	Cys	Gly	Ile	Asp	Ile	Cys	Thr	Leu	Glu	Lys	Thr	Asn	Asn
				2820					2825					2830		
5	Gly	Lys	Glu	Ser	Asp	Lys	Lys	Tyr	Ile	Ile	Met	Lys	Glu	Phe	Val	Lys
			2835					2840				2845				
	Arg	Trp	Leu	Glu	Tyr	Phe	Phe	Glu	Asp	Tyr	Asn	Arg	Ile	Gln	Lys	Lys
			2850				2855					2860				
	Leu	Lys	Thr	Cys	Lys	Glu	Asn	Gly	Lys	Gly	Ser	Thr	Cys	Ile	Arg	Ser
	2865					2870					2875				2880	
10	Cys	Val	Asp	Glu	Trp	Ile	Lys	Leu	Lys	Lys	Asp	Glu	Trp	Gln	Lys	Ile
					2885					2890					2895	
	Asn	Ser	Asn	Tyr	Leu	Asp	Gln	Asn	Thr	Lys	Glu	Asn	Pro	Glu	Gly	Asn
				2900					2905					2910		
	Asn	Leu	Ser	Ser	Phe	Leu	Glu	Asp	Gly	Pro	Phe	Lys	Asn	Glu	Val	Asp
15			2915					2920				2925				
	Lys	Ala	Ile	Lys	Pro	Cys	Gly	Asn	Leu	Thr	Asp	Phe	Lys	Lys	Ser	Lys
		2930					2935				2940					
	Lys	Cys	Asn	Gly	Thr	Ser	Arg	Ser	Gly	Asn	Ser	Glu	Glu	Ser	Thr	Lys
	2945					2950					2955				2960	
20	Tyr	Asp	Gly	Val	Ile	Cys	Leu	Leu	Asp	Asn	Leu	Lys	Asn	Ile	Ile	Lys
					2965					2970					2975	
	Thr	Cys	Gln	Asn	Val	Pro	Ser	Gly	Lys	Pro	Asp	Thr	Pro	Cys	Gln	Lys
			2980						2985					2990		
	Ser	Pro	Ala	Pro	Val	Gly	Asp	Asp	Asp	Pro	Leu	Glu	Glu	Glu	Glu	Asn
25			2995					3000				3005				
	Pro	Val	Thr	Gln	Pro	Asn	Ile	Cys	Pro	Gln	Thr	Ser	Val	Glu	Glu	Lys
		3010					3015				3020					
	Lys	Lys	Glu	Glu	Glu	Glu	Lys	Cys	Asp	Glu	Lys	Glu	Glu	Glu	Glu	Glu
	3025					3030				3035					3040	
30	Lys	Glu	Glu	Glu	Lys	Asp	Lys	Gly	Asp	Glu	Glu	Val	Lys	Glu	Glu	Glu
				3045						3050					3055	
	Lys	Asp	Lys	Gly	Asp	Glu	Glu	Glu	Glu	Ala	Glu	Glu	Glu	Glu	Glu	Glu
			3060					3065						3070		
	Glu	Glu	Glu	Thr	Asp	Ser	His	Ile	Tyr	Glu	Asp	Tyr	Ser	Asp	Ser	Asp
35			3075					3080				3085				
	Ala	Glu	Glu	Asp	Asp	Glu	Asp	Glu	Ala	Val	Thr	Glu	Ser	Leu	Ser	Pro
		3090					3095				3100					
	Ser	Glu	Ser	Gln	Pro	Lys	Arg	Leu	Leu	Arg	Glu	Phe	Pro	Ser	Pro	Glu
	3105				3110					3115					3120	
40	Leu	Lys	Asn	Ala	Met	Leu	Phe	Ser	Thr	Ile	Leu	Trp	Met	Val	Gly	Ile
				3125						3130					3135	
	Gly	Phe	Ala	Ala	Phe	Thr	Tyr	Phe	Phe	Leu	Lys					
				3140					3145							